SOME NOTES ON THE ECOLOGY AND STATUS OF THE ORANGERUMPED HONEYGUIDE *INDICATOR XANTHONOTUS* IN THE HIMALAYAS[1]

S. A. Hussain and Salim Ali[2]

(*With a plate*)

Introduction

The family Indicatoridae comprising of four genera[3] (*Indicator, Melichneutes, Melignomon* and *Prodotiscus*) and 11 species occurs in Africa, India, Burma and Malay archipelago. Of these, four species of three genera are exclusive to Africa and a single genus is represented by five species in Africa and one each in the Indian subcontinent and Malay archipelago. Of the total 11 species, five are known to be brood parasites of other species of birds, while two are suspected to be so in Africa. Another peculiarity of the family is the symbiotic relationship of some species with other animals, and their habit of 'guiding' man to bee hives in Africa.

In a comprehensive monograph based on earlier literature, personal observations, and an analysis of the data collected through various sources Friedmann (1955) has discussed the biological considerations of the family Indicatoridae. His study was mainly prompted by two aspects of behaviour, namely Symbiosis and Brood-parasitism. Since these aspects of behaviour are related to much wider and complicated biological and evolutionary factors it was imperative that all other aspects relating to the complete life history of the family be covered in order to gain a proper insight into this very interesting and unique family of birds. Friedmann's monograph covers almost all aspects of the biology, zoogeography and ecology of the family and provides an excellent comprehensive base line of information on the current status of the family. However, the monograph, as conceded by the author, is by no means complete. Information about several species is either meagre or virtually non existent. Very little is known of the Himalayan Orangerumped Honeyguide. Our information about this bird has been based mainly on some stray notes published by early naturalists and casual observations by later ornithologists during their surveys.

Background

In 1973 Sálim Ali while surveying the avifauna of the eastern Himalayas, discovered about 20-25 honeyguides feeding on a cluster of honey combs in central Bhutan. Considering the observation potential and accessibility of the area, a trip during the putative breeding season (April-May) was proposed to obtain some data on the breeding biology and other behaviour of the bird. The field trip, initiated by the Bombay Natural History Society and financed from the Sálim Ali Nature Conservation Fund (SANCF), was planned for summer 1977. One of us (SAH) spent about a month-and-a-half from mid May to end

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2 Bombay Natural History Society, Horbill House, Shaheed Bhagat Singh Road, Bombay-400 023.

3 There has been some difference of opinion about the number of genera and species. Friedmann (1974), now recognises 17 species.

June and again during October the same year we visited Central and Western Bhutan to study the honeyguide and survey the area. This paper is based on the information gathered during the study period as well as on correlated data from earlier literature and our own notes from other parts of the Himalayas. An attempt is made to substantiate our knowledge of some aspects of behaviour and ecology of this species. Considering the limited scope and potential of the present study, this paper is intended merely as a preliminary assessment for a long term investigation which may be undertaken in future.

Past Literature

The Orangerumped Honeyguide *Indicator xanthonotus* was first described by Blyth in 1842 from a specimen obtained at Darjeeling. Two sub-species have been described in the subcontinent, apart from the nominate race. Hume's *radcliffi,* was described by him based on a single specimen collected from Hazara district in north-west Himalayas, and its validity has been questioned by later ornithologists (Ali and Ripley 1970) due to the lack of supporting material. Ripley (1951) separated the easternmost population as *fulvus* based on two specimens collected by him from Naga Hills. Apart from these there are only occasional notes published in various journals (Hume 1873, Stoliczka 1873, Magrath 1909, Smythies 1949).

No information about eggs, nestlings and fledglings or authentic records of feeding, mating, calls and other behaviour is available. In 1973 we collected eight specimens (3♂♂ and 5♀♀) from central Bhutan on 31st October, and recorded as follows: "A sandstone cliff face *c.* 80 ft. high, c. 100 ft. square, sheer above road, almost overhanging it, with *c.* 15-20 large active combs of *Apis dorsata* at different levels, some very close to one another others more spaced. On approach to spot, on turning a bend, 2 sparrow-like birds flew up from a dry gutter along base of cliff and crossed the path of our jeep showing orange rump. Examination of cliff revealed 27 *I. xanthonotus,* some chasing one another across the cliff face — reminiscent of Baya rivals at nest colony". Recently Cronin and Sherman (1977) have reported on an excellent study carried out by them "over several seasons" in eastern Nepal.

Taxonomical Notes

The Orangerumped Honeyguide is of the size of a sparrow and has perhaps the most striking colour pattern of all the species of honeyguides. Another distinguishing feature is the bill which is small, stout and finchlike.

Description:

Forehead and lores orange. Upper plumage dark grey washed with a tinge of olive on mantle and nape. The dark grey feathers of the primaries and secondaries have pale olive margins giving an overall streaked effect on the dorsal side. Deep orange of the rump extends up to upper back where it is almost sulphur yellow. Primaries and tail feathers dark grey. Chin and throat washed with yellow. Lower plumage pale grey marked with dark grey streaks.

Female: The yellow of the forehead, chin and throat less extensive Rump more yellow than orange, turning into sulphur yellow to almost iridescent white on the upper back. Rest like the male.

Subspecific notes:

Hume's 'species' *radcliffi* was based on a

specimen collected from Hazara in the extreme northwest Himalayas. The validity of this race has not been fully confirmed due to lack of more specimens. Ali & Ripley (1970) mention Hugh Whistler seeing this bird on 24th April 1923 at Trinn, Dharmasala, *c.* 2900 m and consider it as the last authentic record. However, Friedmann (1974) mentioned Walter Koelz's collection in 1940's as containing several specimens of Honeyguides from Garhwal (exact locality not specified). The nominate *xanthonotus* extends eastwards of the range of *radcliffi* along Himalayas upto eastern Bhutan. Recently Ripley (1951) based on two specimens collected by him from Naga Hills, separated the population of north-east Himalayas and Burma as *fulvus*. The specimens differed from nominate race by being smaller and darker; streaking on the abdomen less prominent and yellow wash on the forehead restricted posteriorly. In the absence of comparative material the 3 males and five females collected in 1973 in Central Bhutan may be considered as nominate *xanthonotus*.

Ecological distribution:

The Himalayan distribution of the honeyguide covers a variety of ecozones, from dry deciduous, sparsely covered rugged mountainous region of north-west through transient belts of pine and oak to broadleaved tropical wet evergreen forms of the north-east. The birds have been observed at various altitudes ranging from 1500 m to 3500 m. Ripley (1950) considered them to be altitudinal and seasonal migrants in Nepal. Elsewhere, discussing the ecological aspect he suggested that the westernmost population occurs in the coniferous and dry deciduous open forests while eastern population inhabits the dense wet tropical forests with the population in Nepal adapted to an intermediate vegetational zone.

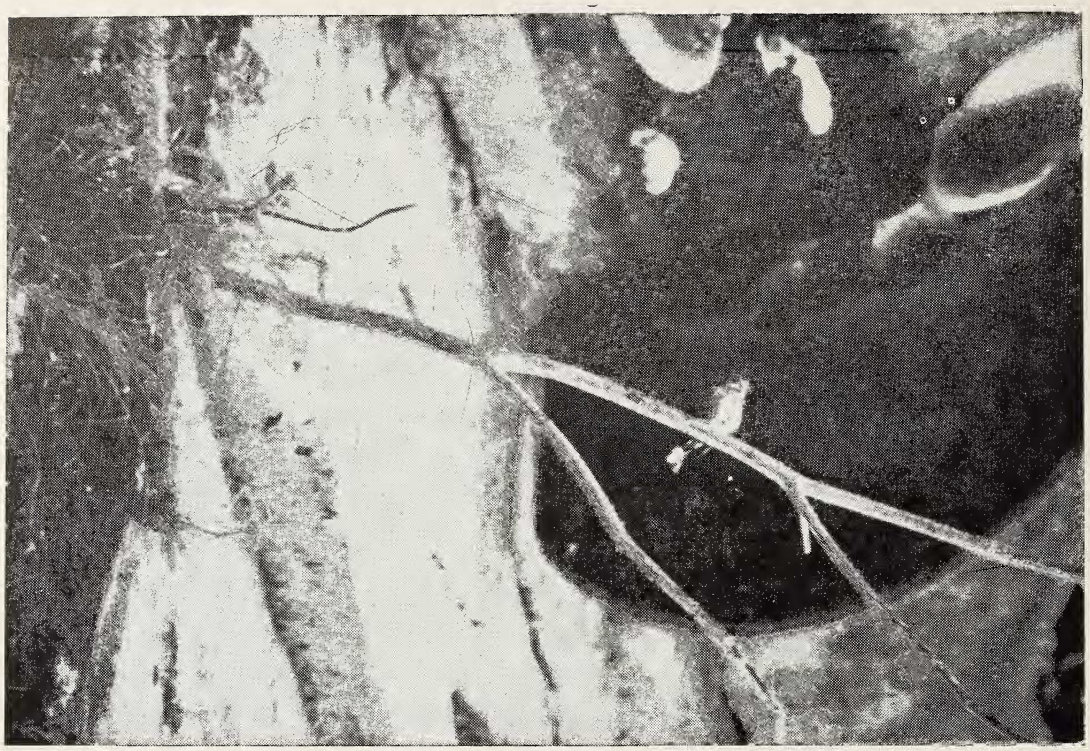
Indicator xanthonotus is perhaps distributed exclusively over a mountainous region. All the other species including the Malayan *I. archipelagicus* occur from sea level up to about 2700 m. The distribution in Africa is characterised by birds of a species occupying diverse habitats with each of its subspecies isolated in a different habitat.

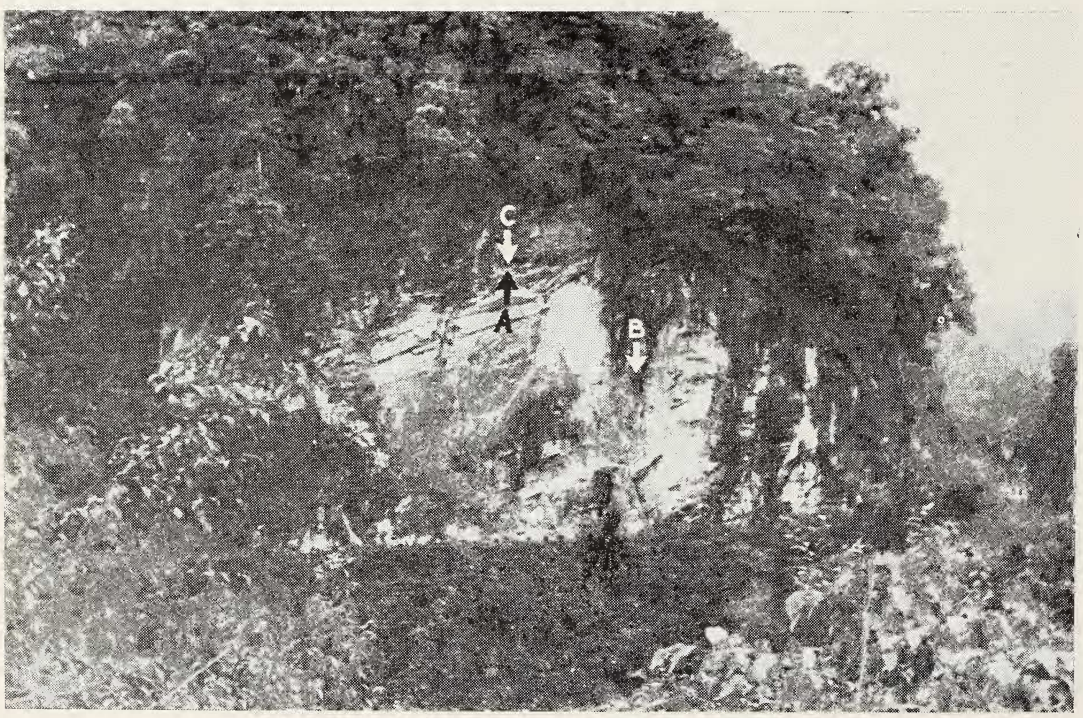
Physiography and vegetation:

The Bhutan Himalayas, unlike Nepal and Sikkim, have not been explored extensively. The climatic and vegetational zones are more or less similar to the Sikkim Himalayas described by Sálim Ali (1962). However, the 'chequering' effect of the overlapping vegetational zones is more pronounced here. The foothills contain dense wet tropical forest and form an evergreen zone to altitudes upto 2500 m. North of this, roughly between 2000 to 3000 m, lies the deciduous zone and above 3000 m begins the alpine zone. The abrupt rise of the hills of central Bhutan reaches up to the Black Mountain range, the main geographic feature of the area. The range provides the major barrier to the onslaught of the S-W monsoon. The 'chequered' character of the vegetation is much in evidence on the rain shadow area. As one crosses the Gulibrong Saddle (*c.* 2300 m) a low pass over the range, and descends to an altitude of about 840 m. the dense evergreen forests give way to a dry-deciduous coniferous zone. This coniferous vegetation in its turn gives way to broadleaved forest as one climbs northwards. This irregular and overlapping vegetation is determined mainly by the elevation, exposure and climatic conditions like precipitation and temperature (Fisher 1971).

Itinerary, Study area and Method:
First trip: *May—June* 1977

S. A. H. reached Bhutan on 11th May and





Above: Rm1 sitting on "Perch A".
Below: "Honey Rock" — a study area in Bhutan. Perches A, B and C (*see* text).

immediately proceeded to Batase the Border Roads camp at Samkhara about 8 km. from "Honey Rock" — the study site. He stayed there for about 27 days from 12th May to 8th June and threafter moved north to Mangdechu *c.* 840 m. (8th-9th June), Shamgong — Khosela, *c.* 1400 m (10th-14th) Tongsa-Gyetsa *c.* 2500 m—3400 m (14th-16th), Bubja *c.* 2500 m (17th) and then on to Thimphu 2700 m (20th-25th) over Pele La *c.* 3900 m and Wangdiphodrang. From Thimphu short trips were made to Wangdi over Dochu La *c.* 3400 m and Chapcha along Thimphu Chu. A total of about 600 km were covered in central and western Bhutan by jeep and on foot.

Second trip: *October* 1977

We (SA, SAH and Shahid Ali) travelled from Thimphu to Tongsa via Wandgiphodrang. Some observations were made at Bubja, about 20 km on the Tongsa-Shamgong road, where a smaller cluster of beehives above the road hosted a single territorial male and several visiting honeyguides. A single mist net was put up about 50 ft. above the road on the rock face and a female honeyguide (the first to be trapped) was ringed. We then moved on to Batase and carried on our studies from 21st October to 30th October at 'Honey Rock'.

Study area:

"Honey Rock" *c.* 1900 m is situated on the southern side of Gulibrong saddle between 54 and 55 km on the main and only motorable road passing through central Bhutan, connecting the border town of Gaylegphug with Tongsa in the interior. There is a cluster of honeycombs under the overhang of a 80-85 ft. high open cliff face. The rainfall in this area is very heavy. The terrain is steep and rugged and contains dense moist evergreen tropical forest. Vegetation is predominantly Oak (*Quercus, Cyclobalanopsis* and *Lithocarpus*) and other evergreens characteristic of warm temperate forests, as well as epiphytes, ferns and orchids. Along the roadsides shrubs of *Rubus* sp. occur patchily. The forest is untouched except for a few patches above the road where there has been some clear felling. The nearest human habitation is about 4 km south where Nepali settlers cultivate wheat, barley and cardamom.

OBSERVATIONS: (May-June 1977)

Due to obvious reasons most of the observations were carried out at Honey Rock. Weather conditions greatly hampered observation consistency and statistical analysis and interpretation of the bionomics and behavioural patterns is not feasible here due to the lack of sufficient material. Some novel and exceedingly interesting aspects of behaviour of *I. xanthonotus* have been reported by Cronin and Sherman (loc. cit.) An attempt will be made here to fill in the gaps and also to comment upon and discuss their study in the light of the observations made by ourselves in Bhutan.

During the 1973 visit to this site about 27 birds had been seen in the course of a 2-hour session. The highest number seen in a day during the present study was three birds. One bird constantly stayed at the rock and was observed chasing/displaying/mating with birds visiting Honey Rock. It was obvious from subsequent observations that this bird was a male holding all the combs at this site as his territory. Three other sites inspected elsewhere in Bhutan also contained one resident male each.

The resident male (hereafter Rml) remained constantly at the site except for brief periods and when chasing away intruders. Saplings growing out of the cliff face were used as perches. Perch A (Plate I) was used most of

the time. The significance of the various perches used is elaborated under territorial behaviour. The earliest activity of the day was observed at 5.15 a.m. and the last at 7.50 p.m. when the bird finally settled on the perch A apparently to roost.

The following notes are mainly based on the observations made on Rml at Honey Rock.

Call: Call note *chip....chip* continuously uttered in flight and also when agitated. The latter invariably preceded the arrival of an alien honeyguide.

Flight: Flight is straight and direct. Some time wheeling and manoevering like a sparrow when flashes of orange rump are visible. The flights reminded SA of 'bayas chasing one another at a nest colony'. Baker's (1927) statement that it has a 'heavy and dipping flight like a larger and more clumsy Barbet' is not true in the case of the birds studied. Moreover, unlike most of the barbets and woodpeckers which have rounded wings, the wings of Orangerumped Honeyguide are narrow and pointed and we noticed no undulations in its flight.

Preening: Preening was observed in detail on three occasions. The bird commenced preening soon after a feed at a honey comb. Initially it wiped its bill on the branch and proceeded to preen.

First the primaries by fanning out a wing. Each primary is then nibbled and drawn out from base to tip. Wing-coverts, upper back and scapulars are dealt with next by stretching the head over the shoulder. The process is repeated on the other wing. The bird then proceeds to preen the tail feathers, first nibbling at the base and drawing out each feather. Head scratching is done by the direct method, that is, bringing the foot up from under the wing. Simmons (1961) has suggested that prior to preening the birds, obtain oil from preen gland by rubbing the bill over the base of the tail. In this case the birds did not appear to obtain any oil from the preen gland. Since the bird had fed on the wax just before could it be that it was using the waxy substance adhering to the bill instead. This aspect needs investigating.

Characteristic postures:

Most of the time Rml sat on perch A motionless yet alert. Sometimes it fluffed its body feathers and 'squatted' with wings dropping at side like a brooding bird. It sat on smooth branches and avoided damp moss and other epiphytes. While feeding on the dry flaky wax of deserted empty combs the bird clung to the comb with its abdomen and tail pressed against the structure. It pecked at the comb by stretching the neck forward. After each peck the bird nibbled the wax in its beak, as if chewing, before taking the next mouthful. It moved along the comb in a series of hops, very much like a sparrow.

Food and feeding habits:

On the first day of observation (12 May) feeding on the honey comb was not observed though the bird alighted twice on one of the combs. However, it was seen sallying up in the air like a drongo hawking insects. On the following day it was observed at a rock crevice well above and away from the combs. It appeared to peck at something by inserting its head inside the crevice (vegetable matter?) Feeding at the wax was observed on nine occasions, each feed lasting from a minimum 3 minutes (15 pecks) to a maximum 22 minutes (82 pecks). Visiting birds were seen on five occasions (only one bird at a time). The visitors' feeding was always interrupted by the arrival of Rml. The longest time a visiting bird fed was for about 20 minutes. This bird had

arrived during the resident male's absence, (while it was chasing another intruder) and was not seen feeding at a comb by Rml when he returned.

The birds fed chiefly on the foundation wax adhering to the rock. They were not observed to disturb the bees or attempt to feed from an active hive. The brown portion of one particular comb measured about 75 cm long, about 45 cm wide and about 5 cm thick. The total estimated area of a fresh comb would be 75 x 60 x 10 cm, of which 15 per cent comprised of white foundation wax.

Territorial behaviour:

As mentioned earlier Rml seldom left the rock site except when chasing off an alien honeyguide. Every visiting honeyguide was challenged by the resident male. At the approach of an intruder, Rml showed considerable agitation, by simultaneously flicking his wings, jerking his body restlessly and calling continuously. He then shuttled between perches A & B (comb check) occasionally 'dive bombing' the alien, and attempting to mount (Female?) or chase it away (Male?). On one occasion, after chasing an alien it flew in a slow circle in front of the rock uttering a call *chaenp. . . . chaenp.*

Apart from Rml at Honey Rock four other territorial males were noted at Chablekhola *c.* 2000 m (one), Bubja *c.* 2500 m (two) and Tongsa *c.* 2500 m (one). At Chablekhola (6 km north of Honey Rock) the resident male was observed for about 8 hours. During this time two alien birds visited and were chased away by the resident. At Bubja two males held territories about 50 m apart on a curved rocky hillside. The two territories were screened from one another by the jutting curve of the rock. One held six old combs and two active hives and the other contained 15 old combs and 10 active hives. About 100 m down hill there was another spot with 15 active hives but no old combs. No bird was noticed there. The birds were observed for about 6 hours and though they did not leave their respective territories, no visiting honeyguides were seen.

Display and mating:

It was not clear whether honeyguides have a regular courtship but some display by Rml was observed whenever a visiting honeyguide arrived to feed at the comb. It alighted near the visitor and started flicking its wings, head held high with bill pointing upwards, feathers fluffed and chest held low, the orange of the rump exposed and conspicuous. The bird swayed its body from side to side. The entire procedure was reminiscent of the arrogant display of cock house sparrow. The resident Rml then followed the alien all over the comb continuing the display while the newcomer either ignored it and continued to feed (female) or flew away (male?) chased by Rml.

Mating was observed on two occasions. On 15th May Rml twice approached a visiting bird and started displaying. On the first occasion the visiting bird ignored him and disappeared behind comb and fed for about 8 minutes. In the meantime Rml went to perch B. When the visitor came out to feed on the upper portions of the comb Rml went up to it and started the display once again. This time the visitor (female) also started flicking the tail, pressed its body and tail down, wings dropping and neck stretched forward. Rml attempted to mount but fell back. It mounted a second time, and copulation lasted for about $\frac{1}{2}$ second. Rml then flew back to perch B while the female continued to feed and flew away after 6 minutes.

A second mating was observed the same day. Two birds arrived at the site. One was

chased away by Rml while the other sat on perch B. Rml returned and spotting the alien sitting on B went and sat alongside and at once tried to mount by perching on its back for about 15 seconds wings fluttering, repeatedly attempting to copulate. He made a second attempt to mount but this time both the birds fell from the perch and spiralled downwards with their feet locked together. They broke away about a meter from the ground and sat on a nearby rock. The visitor then flew away while Rml went back to perch A.

Other associations:

Honey Bees: The association of the honeyguides with the rock bees (*Apis dorsata*) appears to be indirect in so far as the bird is only interested in the wax of the abandoned honey combs. While bees tend to ignore the presence of the honeyguides, the birds did not appear to molest the active hives. There were occasional large scale 'dog fights' among the bees apparently belonging to different hives in the vicinity, and the whole rock face would be swarming with bees. When this happened Rml remained motionless on its usual perch. On several occasions it fed from comb hardly six inches from an active bee hive without causing any disturbance to the bees. An interaction of rockbees, wasps and the honeyguides was recorded during the second trip (Hussain and Ali 1979).

Other species of Birds: Some time was spent observing the breeding activities of other birds in the vicinity of Honey Rock. The following species were noted: Verditer flycatcher (*Muscicapa thalassina*), Himalayan whistling thrush (*Myiophonus caeruleus*) (below the honey combs): Bluebearded bee-eater (*Nyctyornis athertoni*), all feeding young at nest near Honey Rock; Greyheaded flycatcher-warbler (*Seicercus xanthoschistos*), Chestnutheaded Flycatcher-warbler (*M. castaniceps*), Barbets *Megalaima virens* (family parties), *M. franklini* (excavating nest hole), *M. asiatica*, Chestnutbellied Rock Thrush (*Monticola rufiventris*), Sibia *Heterophasia capistrata*, Greywinged Blackbird *Turdus boulboul*, the Woodpecker (*Picus flavinucha, Dendrocopos canicapillus* and *Blythipicus pyrrhotis*), Sipahi Finch *Haematospiza sipahi*, Dipper *Cinclus pallasi*, Forktail *Enicurus maculatus* and Grosbeak *Coccothraustes melanozanthos*.

It was not possible to ascertain whether the honeyguides were in any way directly associated with these birds. The resident male (Rml) was occasionally chased by a pair of Drongos (*Dicrurus* sp.) that visited the rock to hawk small insects. When this happened Rml abandoned its usual perches and sat on the trees on the periphery of the rock. It generally tolerated other small species of birds near its perch. Once it chased a pair of Redwinged Shrike-babblers (*Pteruthius flaviscapis*) that ventured too close to perch A.

Other Vertebrates:

A troop of Rhesus (*Macaca assamensis*) were observed among the trees above Honey Rock in the evening at about 6.30 on 6th June. They were preparing to roost on the trees overhanging the rock and the resident male honeyguide was very much alarmed by the activities of the monkeys. It flew in front of the rock calling repeatedly and avoiding its usual perches, sat on trees on either side of the rock, all the time flicking its wings agitatedly. It finally settled for the night on a branch well away from the rock at about 7.15 p.m. The troop was still there when I (SAH) reached the place next morning at 5.15. The bird was not seen at the site till 7 a.m. three years ago His Majesty's government passed a law banning extraction of honey. That most

TABLE 1

	Area	Habitat	Honey combs old/active	Hrs/obs	Res. Male
1977	Batase Bhutan *c.* 1900m	Broadleaved tropical evergreen forest	9/11	—	1
	Chablekhola Bhutan *c.* 2000m	-do-	7/4	8 hrs	1
	Shamgong Bbutan *c.* 1400m	As above (but no covering trees around the spot)	15+/8	10 hrs	not seen
	Bubja 1 Bhutan *c.* 2500m	Broadleaved tropical evergreen forest	6/2	5 hrs	1
	Bubja 11/ Bhutan *c.* 2500m	„	15/10	5 hrs	1
	Tongsa Bhutan *c.* 2600m	„	6+/4	2 hrs	1
	Gyetsa Bhutan *c.* 3300m	Coniferous	4+/3	6 hrs	—
	10 km from Wangdi Podrang Mixed forest Bhutan *c.* 1400m	Mixed forest	4+/3	2 hrs	—
	Along Thimphu river/ W. Bhutan 1400-2000m	Open Coniferous	about 40/60 scattered along the river course	24 hrs	—
1978	Gangharia 2570m. Garhwal Himalayas	Coniferous	6+/10	3 hrs	1
1980	Namdapha *c.* 1366m E. Arunachal	Evergreen	?	—	—

* the beehives were glassed from a distance of 1000 mts. and the birds were seen.

of the old honey combs at the rock stand untouched could be explained by this fact. However, a considerable area above and beside Honey Rock has been disturbed owing to clear felling of the forests.

Survey

Efforts were made to locate as many honey comb sites as possible. Enquiries made with the Forest Department, Border Roads Organisation and local people revealed several such spots in central and western Bhutan. Some of the areas were not accessible owing to the adverse weather conditions. Those investigated, together with further information gathered elsewhere in the Himalayas, are listed in Table 1, also see Hussain 1978.

Observation October-November 1977

Mist netting and Marking:

During the second trip efforts were made to capture and mark the birds. Cronin and Sherman (1977) had successfully colour-ringed honeyguides in Nepal by luring them to pieces of honey combs placed near a mist net. We put up a single net at Bubja on a steep rock cliff among the clumps of bushes, about 30 ft. above the base of the rock. Though no bait was offered a single ♀ was trapped in the net after an hour's operation. Subsequently we operated two nets at Batase, sometimes baited with wax, and captured and ringed 12 honeyguides (see Table 2).

Behaviour:

There appeared to be a marked increase in the number of honeyguides observed during this period than in May-June. On the first day of our observations at Honey Rock, 20 honeyguides were seen within a period of 8 minutes. The territorial male Rml, (Was he the same as in May-June?) seemed to be under considerable stress from visiting alien birds. About

Table 2

Indicator xanthonotus ringed in Bhutan 1977

Ring No.	Sex	Age	Date	Place	Colouring	Recapture
A—163820	♀	Ad	18/10	Bubja	Orange RL	—
21	♀	,,	21/10	Batase	Red RL	27/10/72
22	♂	,,	21/10	,,	Yellow RL	—
23	♂	FG	21/10	,,	Green RL	—
24	♀	AD	21/10	,,	White RL	—
25	♂	,,	21/10	,,	Red LL	28/10/77
26	♀	,,	21/10	,,	Purple RL	28/10/77
27	♀	,,	27/10	,,	No colour	—
28	♀	,,	28/10	,,	Rose RL	—
29	♀	,,	28/10	,,	Green LL	—
30	♀	,,	29/10	,,	White LL	—
31	♀	,,	29/10	,,	Orange LL	—
32	o?	FG	29/10	,,	Yellow LL	—*

RL = Right leg
LL = Left leg

* Colour of feet greenish, general body moult.